

REMARKS

This response is intended as a complete response to the Office Action dated August 28, 2006. In view of the following discussion, the Applicants believe that all claims are in allowable form.

CLAIM REJECTIONS**§103 Claims 1, 7, 9-10, 15-16, 21-22, 26, 28, and 30-40**

Claims 1, 7, 9-10, 15-16, 21-22, 26, 28, and 30-40 stand rejected under 35 USC §103 as being unpatentable over United States Patent Application Publication No. 2001/0027023, published October 4, 2001 to *Ishihara* (hereinafter *Ishihara*) in view of United States Patent No. 6,419,801, issued July 16, 2002 to *Smith, Jr. et al.* (hereinafter *Smith*). In response, the Applicants have amended independent claims 1, 16, and 35 to more clearly recite aspects of the invention. Claims 7, 9, 21-22, 31-40, have been amended to correspond with the amendments made to the independent claims. Claims 10, 15, and 26 have been cancelled without prejudice.

Independent claims 1, 16, and 35 recite limitations not taught or suggested by any permissible combination of the cited art. *Ishihara* discloses a method of etching an organic layer using a plasma formed from an oxygen-containing gas, a hydrogen-containing gas, and a fluorine-containing gas. See ¶ [0019]. The non-deteriorated portion of the organic layer is ashed using an oxygen plasma in a second step. See ¶ [0137]. A monitor may determine when the etching is complete by monitoring the “light emission caused by CO and H as products from the resist or by O from the added gases.” ¶ [0135] (emphasis added).

As such, *Ishihara* teaches monitoring the plasma for emissions caused by products from the resist or by the added gases. However, *Ishihara* fails to teach or suggest monitoring the plasma for both a byproduct optical emission and a reagent optical emission during the process, as recited in independent claims 1 and 16. In addition, *Ishihara* fails to teach or suggest stopping the etching upon the byproduct optical emission obtaining a first level and the reagent optical emission obtaining a second level, as recited in independent claim 1. Furthermore, *Ishihara* fails to teach or suggest determining an early endpoint indicator by monitoring the plasma for a reagent

optical emission while etching, and determining a final endpoint indicator by monitoring the plasma for a byproduct optical emission while etching, as recited in independent claim 35.

Smith generally discloses monitoring a range of aspects of plasma processing operations. More specifically, *Smith* teaches monitoring plasma processes by collecting optical emissions from the plasma including at least those wavelengths from about 250 nm to about 1,000 nm. See col. 36, l. 65 – col. 37, l. 8. This optical emission data “is used by the current plasma process 250 to determine if subsequent plasma processes conducted in this very same processing chamber 36 are proceeding in accordance with at least one of the plasma processes stored in the normal spectra subdirectory.” Col. 39, ll. 27-31.

However, like *Ishihara*, *Smith* also fails to teach or suggest monitoring the plasma for both a byproduct optical emission and a reagent optical emission during the process, as recited in independent claims 1 and 16. In addition, *Smith* fails to teach or suggest stopping the etching upon the byproduct optical emission obtaining a first level and the reagent optical emission obtaining a second level, as recited in independent claim 1. Furthermore, *Smith* fails to teach or suggest determining an early endpoint indicator by monitoring the plasma for a reagent optical emission while etching, and determining a final endpoint indicator by monitoring the plasma for a byproduct optical emission while etching, as recited in independent claim 35.

As such, *Smith* fails to teach or suggest a modification to the teachings of *Ishihara* that would result in the limitations recited in the claims. Therefore, a *prima facie* case of obviousness has not been established as the combination of the cited references fails to yield the limitations recited in the claims.

Thus, independent claims 1, 16, and 35, and claims 7, 9-10, 15, 21-22, 26, 28, 30-34 and 36-40, dependent thereon, are patentable over *Ishihara* in view of *Smith*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claims allowed.

§103 Claims 2, 6, 13-14, and 17

Claims 2, 6, 13-14, and 17 stand rejected under 35 USC §103(a) as being unpatentable over *Ishihara* and *Smith* and further in view of United States Patent Application Publication 2002/0151156, published October 17, 2002 to *Hallock, et al.* (hereinafter *Hallock*). However, in view of the above-noted amendments and discussion, the Applicants respectfully disagree. In addition, claims 6 and 14 have been amended to correspond with the amendments made to independent claim 1. Claim 13 has been cancelled without prejudice.

The patentability of claims 1 and 16 over *Ishihara* and *Smith* is discussed above. *Hallock* discloses a method for removing a hardened crust on a photoresist after exposure an ion implantation process.

However, like *Ishihara* and *Smith*, *Hallock* also fails to teach or suggest monitoring the plasma for both a byproduct optical emission and a reagent optical emission during the process, as recited in independent claims 1 and 16. In addition, *Hallock* fails to teach or suggest stopping the etching upon the byproduct optical emission obtaining a first level and the reagent optical emission obtaining a second level, as recited in independent claim 1.

As such, *Hallock* fails to teach or suggest a modification to the teachings of *Ishihara* and *Smith* that would result in the limitations recited in the claims. Therefore, a *prima facie* case of obviousness has not been established as the combination of the cited references fails to yield the limitations recited in the claims.

Thus, claims 2, 6, 13-14, and 17 are patentable over *Ishihara* in view of *Smith* and further in view of *Hallock*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claims allowed.

NEW CLAIMS

The Applicants have added new claims 41-45 to the application. Claims 41-43 depend from independent claim 1. Claim 44 depends from independent claim 16. Claim 45 depends from independent claim 35. The Applicants submit that these claims are supported by the specification and are allowable at least for the reasons discussed

above. Accordingly, the Applicants respectfully request entry and allowance of these claims.

CONCLUSION

Thus, the Applicants submit that all claims now pending are in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issuance are earnestly solicited.

If, however, the Examiner believes that any unresolved issues still exist, it is requested that the Examiner telephone Mr. Alan Taboada at (732) 935-7100 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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